

IN THE DRAWINGS:

Please enter the sheet of replacement drawings (Figure 8) that is attached to this Amendment.

REMARKS

The Office Action of July 11, 2005 has been received and its contents carefully considered.

The present Amendment revises independent claims 1 and 22, along with several of the dependent claims. It also transforms claim 16 into an independent claim, and adds new dependent claims 23-25 to further protect the invention.

In response to the drawing objection, on page 2 of the Office Action, a replacement drawing sheet for Figure 8 is attached to this Amendment. As required, Figure 8 is identified as prior art.

The present application discloses a number of embodiments of a semiconductor package with test terminals for testing an integrated circuit in the package and with connection terminals for electrically connecting the integrated circuit to wiring on a printed circuit board. The inventor has realized that testing is typically conducted using precision equipment, with probes that make contact with test terminals but are not permanently connected to the test terminals. On the other hand, when a semiconductor device is soldered to a printed circuit board at a factory using automated equipment, the semiconductor device must be positioned with respect to the board, and the accuracy is typically not as high as the accuracy during testing. The present inventor has realized that this means that space can be saved if a semiconductor package carries test terminals in addition to connection terminals, since the test terminals can be crowded closer together.

The Office Action rejects independent claims 1 and 22 for anticipation by either U.S. patent 5,729,894 to Rostoker et al, Japanese patent publication 2000-068403 to

Ando, or U.S. patent 6,815,621 to Park et al. For the sake of convenience, the Rostoker et al patent and the Park et al patent will hereafter be called simply “Rostoker” and “Park.” The Office Action also rejects claims 16 (now independent) for anticipation by Park. For the reasons discussed below, however, it is respectfully submitted that the independent claims now pending in this application are patentable over the cited references.

Independent claim 1 now recites a semiconductor package which has “a surface with a plurality of connection terminals to be connected to wiring on a board and a plurality of test terminals that are electrically isolated from the wiring on said board.” In contrast, the closely-spaced terminals in region 508 of Rostoker’s Figure 12 (the same figure that is reproduced on the cover page of the reference) are connected to lines 510 on a printed circuit board. Furthermore, an ordinarily skilled person would have had no reason to suspect that the terminals in Rostoker’s region 508 area test terminals, in accordance with claim 1.

Accordingly, it is respectfully submitted that Rostoker does not anticipate claim 1. Moreover, the reference does not provide an incentive that would have led an ordinarily skilled person to modify what Rostoker discloses so as to achieve the invention defined by claim 1.

Independent claim 22 is now directed to a lead-type semiconductor package which has “a plurality of connection leads to be connected to wiring on a board and a plurality of test leads that are electrically isolated from the wiring on said board.” For the reasons mentioned above with respect to claim 1, it is respectfully submitted that the invention defined by claim 22 is neither disclosed nor suggested by the Rostoker patent.

Turning next to Ando, it is respectfully submitted that an ordinarily skilled person would have appreciated that the purpose of Ando's solder bumps 13 is to dissipate heat, not to serve as test terminals. Moreover, it would appear from Ando's Figure 2 that the solder bumps 13 may be connected to a wiring on Ando's printed circuit board. It is therefore respectfully submitted that Ando would not have disclosed the inventions defined by independent claims 1 and 22 to an ordinarily skilled person. Neither would the reference have provided an incentive to modify what is disclosed so as to achieve the invention of claims 1 and 22.

Figure 16 of the Park reference shows first and second sets of solder balls, 52 and 53. The solder balls 53 are disposed at a narrower pitch than the solder balls 52. However, Park uses his solder balls 52 for transmission of address and command signals, and his solder balls 53 for I/O of data signals (see column 10, lines 1-17).

The Park reference does not disclose test terminals. Nor does it disclose terminals that are intended to be electrically isolated from wiring on a printed circuit board. Accordingly, it is respectfully submitted that the inventions defined by independent claims 1 and 22 are patentable over the reference.

Independent claim 16 is directed to a semiconductor which has "a surface with a plurality of connection terminals to be connected to wiring on a board and a plurality of test terminals for testing circuitry within the package before the connection terminals are connected to the wiring on the board and to be connected to a ground on the board when the connection terminals are connected to the wiring on the board." Park does not disclose test terminals. Nor does he disclose test terminals that are connected to a ground on a printed circuit board in use. Moreover, it is respectfully submitted that nothing in

the reference would have led an ordinarily skilled person to the invention defined by claim 16.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. Reconsideration of the application is therefore respectfully requested.

It is noted that the application has been amended to include three additional claims in excess of twenty. Accordingly, an additional claim fee of \$150 is included in a remittance that is being submitted concurrently.

Respectfully submitted,



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